
Stem cells reveal elusive developmental steps, origins of disease

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Our colleagues at Sanford-Burnham Medical Research Institute have a post today on their excellent blog about work by CIRM grantee Alexey Turskikh, published in a recent issue of PLoS ONE. The team's work is another example of how embryonic stem cells can help scientists understand early events in development.

The team has been interested in a group of cells called the neural crest, which eventually form nerves, skin, bone and muscle in the developing embryo. If scientists could understand this important developmental step they could also understand diseases that result when those steps go awry. The problem is that they can't very well monitor the process in a developing human.

That's where embryonic stem cells come in. The team developed a method of maturing embryonic stem cells into neural crest cells. Sanford-Burnham writes:

“With this method, Dr. Turskikh's group and others will now be able to better study what defines human neural crest stem cells, how they migrate during development, how they differentiate into other cell types, and the mechanisms that guide these processes. What's more, producing workable quantities of neural crest stem cells in the laboratory might allow scientists to generate more of the tissues that they become – including clinically-relevant cell types like skin cells or neurons.

According to Dr. Maurer, one of the study's co-authors, "This research allows for fast and easy access to an important developmental structure and one of the best examples of a particular stage in development – the epithelial-mesenchymal transition (EMT). Since EMT is now a hot topic in tumorigenesis and cancer progression, these cells might help us better understand the molecular mechanisms governing that process."

There's a long path from finding the cells to developing cures, but you don't get to the end of a race without taking the first step.

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- A.A.

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